Friedenwald (H.)

ON MOVEMENTS OF THE EYELIDS ASSOCIATED WITH MOVEMENTS OF THE JAWS AND WITH LATERAL MOVEMENTS OF THE EYEBALLS.

By Harry Friedenwald, A. B., M. D.

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At a recent meeting of this Society (October 7, 1895), Dr. Thomas presented a patient with unilateral congenital ptosis. In the course of his remarks he described certain associated movements occasionally seen in cases of ptosis, though the patient presented did not definitely show this peculiarity. In a conversation with Dr. Thomas I mentioned a number of cases which had come under my observation, some of the patients being under treatment at the present time, and at Dr. Thomas's kind invitation I have the honor to present a few to you this evening.

Quite a number of associated movements of the upper lids have been described; these vary greatly. In some, as in the cases referred to by Dr. Thomas, there was ptosis, but in others the same peculiar association of movement existed without ptosis. The lid movements occurred in some in association with opening and closing or with lateral movements of the jaws, in others they were associated with lateral movements of the eyeballs.

A. I shall first present a case of the former variety.†

C. D., female, aged 9, has normal eyes excepting slight

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*Read before the Johns Hopkins Hospital Medical Society.

†This variety has been carefully studied by Dr. M. Bernhardt in the "Beitrag zur Lehre von den eigenthuemlichen Mitbewegungen des paretischen oberen Lides bei einseitiger angeborener Lidsenkung," Neurol. Centralb., 1894, p. 325. He has collected all the published cases and discusses the various explanations that have been given. We shall therefore refrain from entering upon a discussion of the subject in this paper and limit ourselves to the report of two new cases, one of which is quite unique.

hypermetropia. The movements of the eyeball are perfectly normal in every direction. There is no ptosis of either eye, but the right palpebral fissure appears on very careful examination to be a trifle smaller than the left, the difference being about 1 mm.

She was first brought to me by her mother, who complained that when the child ate, the right eye assumed a peculiar and repulsive appearance. This had been noticed since she was an infant. Giving her something to chew, especially when she is looking down, demonstrates the peculiar association of movement. It is seen that the right upper eyelid is drawn forcibly upwards only in lateral movement of the jaw and, what is most curious, only when the jaw is moved toward the same side as that of the eye. During protracted lateral movements the lid is spasmodically raised and soon assumes a condition of continuous contraction. These peculiar movements become less marked when the patient's gaze is directed forward, and are not at all visible when she looks upward.* Two similar cases have been reported (Gunn, Schapringer); in both there was ptosis, and lateral movement of the jaw produced elevation of the lid, but in both this was associated with a movement of the jaw toward the side opposite the eye; in other words, the levator palpebræ superioris was excited into action by muscular effort of the pterygoid of the same side. The same relation existed in all those cases in which the eyelid was retracted both by opening the mouth and by lateral movements of the jaw. The case presented is unique in showing *association of the levator with the pterygoid of the opposite side.* (Demonstration of case.)

The second case which I wish to present is Miss R. S., aged 20; she was treated for slight error of refraction which produced asthenopia; there is slight drooping of the right eyelid.

When she eats, the right eye becomes widely dilated, 2 mm. at least of the sclerotic being thus exposed above the cornea. The lid is elevated only during lateral movements of the jaw, but I have not been able to determine whether it is the movement toward the same side or the opposite. Besides these defects there is slight crossed diplopia in the left portion of the field of fixation, with several degrees of vertical displace-

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*See Sinclair, Ophthalmic Review, Oct., 1895, p. 308.

ment, the image of the right eye being higher. She is positive in stating that the peculiar movements of her lid came on *not earlier than six years ago.* Unlike the other cases that have been described, this was not congenital. (Demonstration of case.)

B. We may next direct our attention to the association of movement of the lids with lateral movements of the eyeballs.

The published cases belonging to this category are as follows:

Case I.*—F. W. Browning (Trans. Oph. Soc., 1890, p. 187), male, aged 46. When he looked outwards, either to the right or to the left, the upper lid of the same side drooped, while the other was slightly elevated. The lid movement was more marked on the left side. When he converged strongly, both upper eyelids were simultaneously raised above the horizontal —the left most so. As he followed the descending finger, the eyelids followed the globes down to the horizontal, but there remained stationary. All extreme movements of the eye produced coarse nystagmus.

Cases II and III,* Dr. Sidney Philips (Trans. Oph. Soc., 1887, p. 306). Condition present in two brothers, aged 7 and 3 years. When the eyes were directed outwards, to the right or to the left, the upper eyelid of the other side drooped, that of the same side "remained raised."

Case IV,* Pflüger (XX. Congress of Heidelberg, S. 202). Female, aged 18. When looking to the left the palpebral aperture was wide open; looking straight forward produced a slight drooping of the right upper eyelid, while looking to the right brought on complete ptosis of the right eyelid. The patient could not overcome this ptosis voluntarily. Looking up (and to the right) did not alter the position of the eyelid. Strong movement to the left produced extreme opening of the palpebral aperture, which was maintained if the eye was likewise directed downwards.

The first to systematically study these cases was Fuchs (Deutschmann's Beiträge zur Augenheilk., Vol. II, p. 12). He published eight cases. In three of these the lid was raised when the eye was abducted (Cases V, VI and VII).

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*Abstracted by Sinclair, Ophthalmic Review, Oct., 1895.

Case V, male, 29 years; ocular movements normal. On looking directly forward no difference is noticeable in the palpebral opening on both sides, but when the right eye is adducted the eyelid droops. The affection was probably congenital.

Case VI, male, 45, syphilitic. Right eye: slight ptosis and paresis of the internal rectus, pupil dilated, and the accommodation paralyzed. This condition disappeared under treatment with potassium iodide, but at the same time the like affections appeared in the left eye. It was then that the left upper eyelid showed the associated movements under consideration —it was raised in abduction of the eye, but drooped in adduction. A year afterwards the ptosis had entirely disappeared, and likewise the associated movement. There was absolute paralysis of convergence (though the lateral movements were normal), the pupils were unequal and stationary, and there was paralysis of the accommodation.

Case VII, female, æt. 20. Paresis of the external recti muscles, especially of the right, and slight ptosis of both upper eyelids, slightest on the left side. (The ptosis on the left side soon disappeared.) In looking to the right, the eyelids remain in the same position, but in looking to the left the eyelids fall 2 mm. In convergence or when the eyes are raised or lowered there are no peculiar movements of the eyelids. In this case there was relaxation of the right lid in adduction, and of the left in abduction.

In five of Fuchs's cases the upper lid was raised during adduction of the eyeball.

Cases VIII, IX, X, XI, XII.—His five patients were all adults. In one only was the affection congenital. All had ocular paralyses (probably nuclear); three had paralysis of all the muscles supplied by one oculo-motor nerve, one of the superior rectus and levator palpebræ, one of the superior and internal rectus with slight paresis of the inferior rectus. In three of the cases the contraction of the paretic upper lid was so great during adduction of the eye that it rose higher than on the healthy side. Two of the cases showed contraction of the pupil during adduction, and in one there were interesting rhythmic associated movements of the lid and pupil. To these cases we must add the last one of Fuchs's mentioned under

the former head of associated movements, in which the right lid relaxed in adduction, while the left relaxed in abduction.

These cases belong to the same class as those of Browning and Pflüger described above. They are the only ones that have hitherto been published. I shall add one to the list. (See Case XXIV.)

In 1893 we described two cases (Archives of Ophthalmology, Vol. XXII, p. 349), similar to cases of V, VI and VII (of Fuchs).

Case XIII, Miss S. W., æt. 11. The right eye appeared normal, but the left was smaller and lay deeper in the orbit. It was found that the movements of the left eye toward the nose were somewhat restricted, but that there was almost complete paralysis of the external rectus muscle. When the attempt is made to look to the left, the left upper lid is raised so much that the palpebral fissure is as large as on the right side. If the eyes are turned to the right, the left palpebral fissure becomes very narrow. This patient had binocular vision when the eyes were directed forwards.

Case XIV, B. C., æt. 17, female, white. There was complete paralysis of the left external rectus with very slight convergent strabismus when looking directly forward. There was probably binocular vision. When the eyes are moved to the right or when the eyes are converged, the left palpebral fissure is much smaller than on the right side. On moving the eyes to the left (the left eye does not move beyond the median line), the left palpebral fissure becomes so wide that about 1 mm. of sclerotica is exposed above the cornea.

Sinclair (in the Ophthalmic Review for October, 1895) describes five cases in all respects similar to Fuchs's and my own (Cases V, VI, VII, XIII, XIV). These he has overlooked, stating that no cases similar to his own are on record.

His cases XV to XIX are all children; four are girls. In all of them the left eye is affected. The external rectus is paralyzed in all the cases; the internal is weak in three.

To these I wish to add the following, the first of which is here presented to you:

Case XX, A. V., female, aged 10. The patient has slight enophthalmus of the right eye and a rather high degree of hypermetropia, but otherwise the eyeballs are normal. In

direct vision the palpebral fissures are about equal. The lateral movements of the right eye are very defective. Adduction is considerably impaired, the eyeball turning but slightly inwards, and moving in an upward direction when attempts at adduction are made. At the same time the enophthalmus is markedly increased. Movements inward and downward are not at all impaired. There is complete paralysis of abduction, the right eye not moving beyond the median line. There is no diplopia, and in direct vision it was shown that the patient had binocular vision.* This, together with the history furnished by the mother, proves that the condition was congenital.

The associated movements to be described are as follows:

The right palpebral fissure measures 6 mm., the left 8 mm. when she looks towards her left; attempting to look toward her right, her right palpebral fissure becomes 10 mm., the left remaining about the same. The difference becomes still more marked when the lateral movements are made in a plane below the horizontal; looking toward her left the right eye almost closes, the palpebral fissure measuring 2 to 3 mm.; looking toward the right widens the fissure to 8 to 9 mm. (Demonstration of case.)

A similar case is No. XXI. Miss E. V., aged 20, had a paralytic stroke when she was five years old. Up to that time her eyes were normal, afterwards her eyes were crossed; no diplopia. There is paralysis of the external rectus of the left eye. When looking to her right, the left palpebral fissure becomes smaller than the right; on looking in the opposite direction, the relative size of the palpebral fissures becomes inversed.

Case XXII is very interesting in other respects:

H. F., aged 19, complained that he was forced to move his head from side to side in reading. V. RE. perfect; L. E. amblyopic. There was *complete congenital paralysis of abduction and adduction of both eyes.* Movement upwards and downwards perfectly normal. In attempting to look toward the right the left lid drooped somewhat, but was opened widely when looking in the opposite direction.

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* Tests were made with the stereoscope and by means of Lippincott's method. Toward either side there was no binocular vision.

Case XXIII. Mrs. M. B., aged 59, fell when 18 months old and injured the left eye. The left eye appears to be deeper set than the right eye. There are several scars about the orbital region. The left palpebral fissure is 2 mm. smaller than the right in direct vision. Looking toward the right, both eyes move properly, but the left palpebral fissure becomes much smaller. Looking toward the left, we find complete paralysis of the left external rectus, and the left fissure becomes much larger than the right. There is no drooping in accommodation.

It is very curious that in almost all these cases it is the left eye that is affected. It is likewise remarkable that the great majority are females.

The next case is one in which the eyelid droops with abduction, and is raised in adduction, as in cases VIII, IX, X, XI, XII (of Fuchs).

Case XXIV. J. F., aged 35, has cerebral syphilis. The patient suffered a severe apoplectic attack four years after the secondary signs occurred. There was paralysis of the left leg and arm, and later the right leg and arm and the right eye were paralyzed. The right eyelid drooped and a high degree of divergence set in (ocular-motor paralysis). His condition gradually improved. When examined (September 6, 1894) we found in the right eye paralysis of the internal rectus (not complete, eye can be brought into median line by great effort), complete paralysis of the upward and downward movements. Movements outward normal. The left eye showed paresis of the internal superior and inferior recti; external rectus normal. There is no movement downward and outward in either eye, which would indicate paralysis also of the superior oblique. The levators are almost normal. When the patient looks to the right, the right upper eyelid droops, making the right palpebral fissure smaller than the left. When looking to the left, the right palpebral fissure becomes widely dilated, so that a part of the sclera is exposed above the cornea, while the left eyelid droops so far as to reach the upper margin of the pupil. Pupils are of medium size, do no react alike, the left seems to react slightly to accommodative impulses. Vision of neither eye greatly impaired (6/12, 6/9 without glasses).

From this list we see that there are eight cases (I, IV, VIII,

IX, X, XI, XII, XXIV) in which the upper eyelid is raised in attempts at adduction and droops in abduction, and that there are on the other hand fifteen in which the opposite conditions prevail.

In one case (VII) there was relaxation of the right lid in adduction and of the left in abduction.

Taking the first set of cases into consideration, we find that six of the eight cases are males; that in five the condition was acquired, and in three it was congenital; in one there was no paralysis of the ocular muscles, in four the ocular-motor nerve was completely paralyzed; in one the superior and the levator; and in one there was double oculo-motor paralysis; and in one both superior recti were affected.

In the last named case all external movements produced nystagmus.

In two of the cases the pupil contracted during adduction, and in one there were rhythmic movements of the lid and pupil.

In the second group of fifteen cases (in which the lid is raised in abduction and droops in adduction) six were males and nine females.

The condition was congenital in twelve, in two it was acquired in infancy; in the remaining case it was acquired after oculo-motor paralysis, and disappeared in a year. There was no paralysis in four cases; the external rectus was paralyzed in ten cases, and in four of these the internal was also paretic. In one case (Case XXII) both external and internal recti were paralyzed. The affection was limited to one eye, excepting in one case in which both eyes were affected.

In seven cases there was enophthalmus. In one of the cases there is a note that the drooping of the lid also occurred when the eyes were converged (Case XIV); while in another (Case XXIII) the adduction in convergence did not produce drooping, while adduction in lateral movements did.

In eleven cases the left eye was affected, in two the right eye, and in three both eyes. Finally there was one case (Case VII) which belongs to both classes. In this both external recti were affected, and there was slight ptosis.

It is evident that while the oculo-motor nerve is the one paralyzed in the first class of cases, it is the abducens which is chiefly affected in the second class.

No satisfactory explanation of these conditions has been given. It is probable that when acquired after paralysis they belong to the same category as those associated movements observed in hemiplegia. For the larger number, the congenital cases, we may assume the existence of abnormal relations of the cerebral nuclei and association fibres, but this is only restating the question.

C. The following cases are of interest as showing the closer association between the superior rectus and the levator than between the two levators.

Mrs. E. H., aged 44. Ten years before examination paralysis of left leg and arm, and later of the right leg. At the same time paralysis of the right eye. At the time of examination the patient was able to walk, but dragged the right leg. There was diabetis insipidus. The right eye showed complete paralysis of superior and inferior movements; there was slight ptosis of the left upper lid. Looking forward, the left fissure is 2 to 3 mm. narrower than right. Looking down, the *left eye does not follow the movement of the right, but remains looking directly forward and the eyelid remains open.*

R. W., male, aged 21, colored. Left convergent strabismus since childhood of very high degree. Movements of this eye are peculiar; they are limited to an upward and inward movement. When the patient looks down with the right eye the left eye looks forward and slightly inward, and *the upper lid remains raised,* even when the right eye looks downward to that degree that it is almost closed.

Neither of these patients has any difficulty in opening or closing the eyelids.